National Institute of Environmental Health Sciences

Surveillance of vector-borne diseases in Germany: Trends and challenges in the view of disease emergence and climate change

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Abstract:

The changing epidemiology of vector-borne diseases represents a growing threat to human health. Contemporary surveillance systems have to adapt to these changes. We describe temporal trends and geographic origins of vector-borne diseases in Germany with regard to strengths of existing disease surveillance and to areas marked for improvement. We focused on hantavirus infection (endemic in Germany), chikungunya fever (recently emerging in Europe) and dengue fever (imported from tropical regions), representing important subgroups of vector-borne infections. Routine surveillance data on demographics, origin of infection and the date of reporting were analysed. From 2001 through 2007, 3,005 symptomatic hantavirus infections, and 85 cases of chikungunya fever were reported, similarly 1,048 cases of dengue fever in 2002 through 2007. The geographic origin of hantavirus infection was reported for 95.5% of all cases (dengue virus, 98.4%; chikungunya virus, 100%). Hantavirus infections were acquired in Germany in 97.6% of cases (n Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 2800). In 2007, there was a marked increase of hantavirus cases, mainly in areas known to be endemic for hantavirus. In 2006, imported cases of chikungunya fever primarily returned from several islands of the Indian Ocean, while the majority of imported cases in 2007 came from India. The reported number of dengue fever cases have increased since 2004. Thailand contributed the largest proportion of cases (17-43% in individual years), followed by India, Brazil and Indonesia. Surveillance of notifiable vector-borne diseases in Germany is able to timely detect spatial and temporal changes of autochthonous an imported infections. Geographic and temporal data obtained by routine surveillance served as a basis for public health recommendations. In addition to surveillance of vector-borne infections in humans, nationwide monitoring programs and inventory techniques for emerging and reemerging vectors and for wildlife disease are warranted.

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Resource Description

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Human Conflict/Displacement

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Germany

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease, Zoonotic Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Chikungunya, Dengue

Zoonotic Disease: Hantavirus Pulmonary Syndrome

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: ☑

format or standard characteristic of resource

Review

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content